

The Periodic Table and the Elements



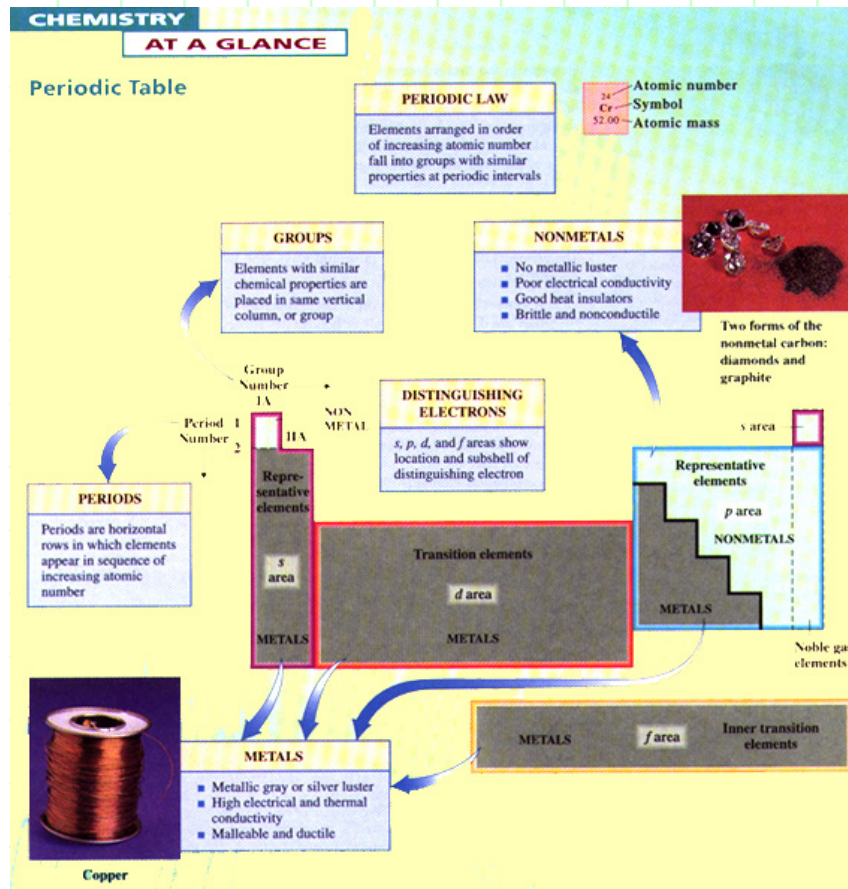
Physical Science
DSHS

The Periodic Table and the Elements

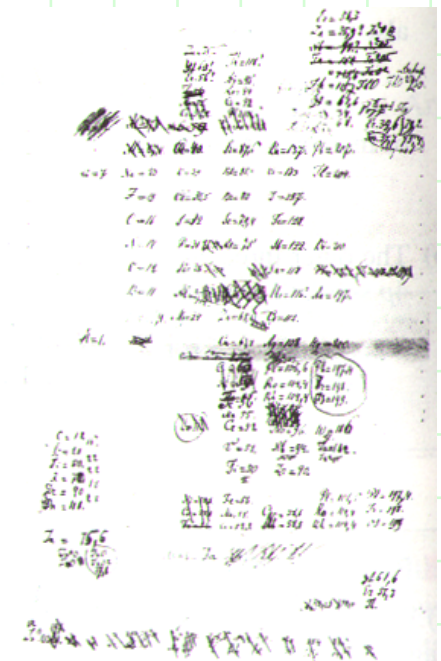
What is the periodic table ?

What information is obtained from the table ?

How can elemental properties be predicted base on the PT ?



Periodic Table

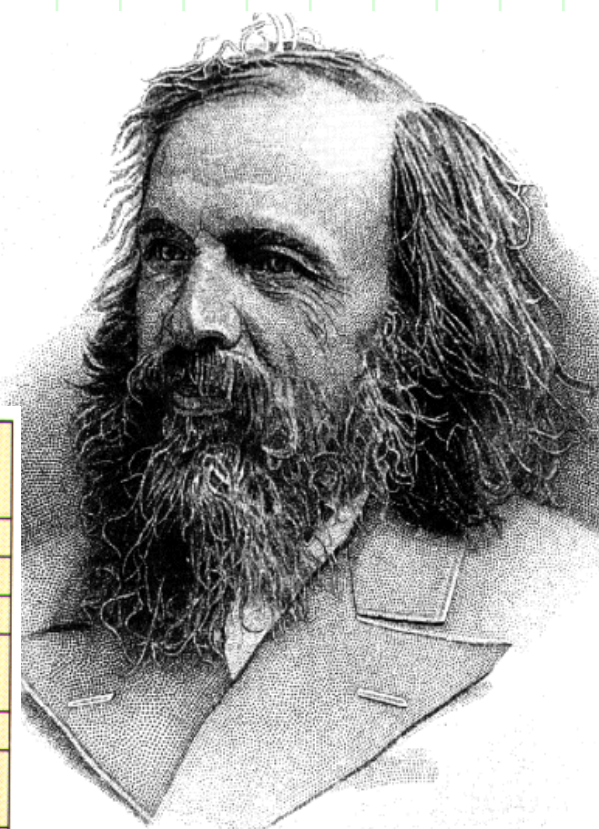


(1869)

In 1869 Mendeleev and Lothar Meyer (Germany) published nearly identical classification schemes for elements known to date. The periodic table is based on the similarity of properties and reactivities exhibited by certain elements. Later, Henri Moseley (England, 1887-1915) established that each element has a unique atomic number, which is how the current periodic table is organized.

Row	Group I — R ₂ O	Group II — RO	Group III — R ₂ O ₃	Group IV RH ₄ RO ₂	Group V RH ₃ R ₂ O ₅	Group VI RH ₂ RO ₃	Group VII RH R ₂ O ₇	Group VIII — RO ₄
1	H = 1							
2	Li = 7	Be = 9.4	B = 11	C = 12	N = 14	O = 16	F = 19	
3	Na = 23	Mg = 24	Al = 27.3	Si = 28	P = 31	S = 32	Cl = 35.5	
4	K = 39	Ca = 40	— = 44	Ti = 48	V = 51	Cr = 52	Mn = 55	Fe = 56, Co = 59, Ni = 59, Cu = 63
5	(Cu = 63)	Zn = 65	— = 68	— = 72	As = 75	Se = 78	Br = 80	
6	Rb = 85	Sr = 87	?Yt = 88	Zr = 90	Nb = 94	Mo = 96	— = 100	Ru = 104, Rh = 104, Pd = 106, Ag = 108
7	(Ag = 108)	Cd = 112	In = 113	Sn = 118	Sb = 122	Te = 125	I = 127	
8	Cs = 133	Ba = 137	?Di = 138	?Ce = 140				
9								
10			?Er = 178	?La = 180	Ta = 182	W = 184		Os = 195, Ir = 197, Pt = 198, Au = 199
11	(Au = 199)	Hg = 200	Tl = 204	Pb = 207	Bi = 208			
12				Th = 231		U = 240		

<http://www.chem.msu.su/eng/misc/mendeleev/welcome.html>



Mendeleev.

Known Elements in 1870's

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 H Atomic Sym																	2 He
2	3 Li	4 Be																10 Ne
3	11 Na	12 Mg																18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	57-71	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	89-103	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo
Select a year to dim elements discovered after that year.																		
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	57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu			
	89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr			

Periodic Table Expanded View

The Periodic Table was not always the way we see it. It has gone through many changes through the years. The most significant was the rearrangement of the Transition elements.

1																	2										
H																	He										
3	4																	19	20								
Li	Be																	B	C	N	O	F	Ne				
11	12																	27	28	29	30	31	32	33	34	35	36
Na	Mg																	Al	Si	P	S	Cl	Ar				
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54										
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe										
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86										
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn										
87	88	89	104	105	106	107	108	109	110																		
Fr	Ra	Ac	Rf	Ha	Sg	Ns	Hs	Mt	Uun																		

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Period

Main Group

Noble Gases

1

1
H
1.0079

II A
2

III A
13

IV A
14

V A
15

VI A
16

VII A
17

VIII A
18

2

3
Li
6.941

4
Be
9.0122

5
B
10.811

6
C
12.0112

7
N
14.0067

8
O
15.9994

9
F
18.9984

10
Ne
20.179

3

11
Na
22.989

12
Mg
24.305

13
Al
26.9815

14
Si
28.0855

15
P
30.9738

16
S
32.06

17
Cl
35.453

18
Ar
39.948

4

19
K
39.098

20
Ca
40.08

21
Sc
44.9559

22
Ti
47.88

23
V
50.9415

24
Cr
51.9961

25
Mn
54.938

26
Fe
55.845

27
Co
58.9332

28
Ni
58.6934

29
Cu
63.546

30
Zn
65.38

5

37
Rb
85.468

38
Sr
87.62

39
Y
88.9058

40
Zr
91.224

41
Nb
92.9064

42
Mo
95.94

43
Tc
98

44
Ru
101.07

45
Rh
102.9055

46
Pd
106.42

47
Ag
107.8682

48
Cd
112.404

6

55
Cs
132.905

56
Ba
137.34

57
La
138.905

58
Ce
140.12

59
Pr
140.907

60
Nd
144.24

61
Pm
144.9126

62
Sm
150.36

63
Eu
151.964

64
Gd
157.25

65
Tb
158.925

66
Dy
162.50

67
Ho
164.930

68
Er
167.26

69
Tm
168.934

70
Yb
173.04

71
Lu
174.967

7

87
Fr
223*

88
Ra
226**

89
Ac
227*

90
Th
232.038

91
Pa
231.04

92
U
238.03

93
Np
237*

94
Pu
242**

95
Am
243.06

96
Cm
247*

97
Bk
247*

98
Cf
251*

99
Es
254*

100
Fm
257.095

101
Md
258.10

102
No
259.10

103
Lr
260.105

Key

1

Hydrogen
H
1.0079

Atomic number
Name
Symbol
Atomic weight

Color Key

Metal

Nonmetal

Noble Gases

Transition Elements

III B

IV B

V B

VI B

VII B

VIII B

VIII B

VIII B

VIII B

VIII B

VIII B

IB

IIB

4

21
Sc
44.956

22
Ti
47.90

23
V
50.942

24
Cr
51.996

25
Mn
54.938

26
Fe
55.847

27
Co
58.933

28
Ni
58.693

29
Cu
63.546

30
Zn
65.38

5

39
Y
88.905

40
Zr
91.22

41
Nb
92.906

42
Mo
95.94

43
Tc
98

44
Ru
101.07

45
Rh
102.905

46
Pd
106.42

47
Ag
107.868

48
Cd
112.40

6

57
La
138.91

58
Ce
140.12

59
Pr
140.91

60
Nd
144.24

61
Pm
144.91

62
Sm
150.36

63
Eu
151.96

64
Gd
157.25

65
Tb
158.93

66
Dy
162.50

67
Ho
164.93

68
Er
167.26

69
Tm
168.93

70
Yb
173.04

71
Lu
174.97

7

89
Ac
227*

90
Th
232.04

91
Pa
231.04

92
U
238.03

93
Np
237*

94
Pu
242**

95
Am
243.06

96
Cm
247*

97
Bk
247*

98
Cf
251*

99
Es
254*

100
Fm
257.09

101
Md
258.10

102
No
259.10

103
Lr
260.11

Inner Transition Elements

6

7

58 Ce 140.12	59 Pr 140.907	60 Nd 144.24	61 Pm 144.9126	62 Sm 150.36	63 Eu 151.964	64 Gd 157.25	65 Tb 158.925	66 Dy 162.50	67 Ho 164.930	68 Er 167.26	69 Tm 168.934	70 Yb 173.04	71 Lu 174.967
90 Th 232.038	91 Pa 231.04	92 U 238.03	93 Np 237*	94 Pu 242**	95 Am 243.06	96 Cm 247*	97 Bk 247*	98 Cf 251*	99 Es 254*	100 Fm 257.095	101 Md 258.10	102 No 259.10	103 Lr 260.105

* Isotope with longest half-life

** Better known isotope

The Periodic Table

A map of the building blocks of matter.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 H	Atomic Sym		C Solid														2 He
2	3 Li	4 Be	Hg Liquid															10 Ne
3	11 Na	12 Mg	H Gas															18 Ar
			Rf Unknown															
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	57-71	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	89-103	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo

For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

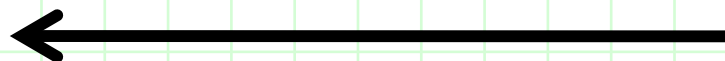
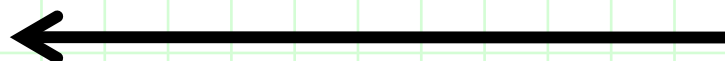
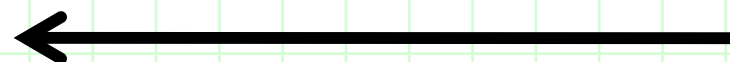
WHY DON'T WE DISPLAY

THE PT THIS WAY?

Describe how to read the periodic table:

Every square on the
table
has:

5
B
10.81



Notice that the atomic mass is not a whole number..... That is because it is an _____. This is the sum of the masses of all isotopes of that element multiplied by their natural abundance.

&

Increase as you move...
LEFT TO RIGHT
TOP TO BOTTOM

The periodic table is color-coded by groups: Alkali metals (orange), Alkaline earth metals (yellow), Lanthanoids (light blue), Actinoids (dark blue), Transition metals (green), Post-transition metals (light green), Metalloids (purple), Other nonmetals (dark purple), Halogens (red), Noble gases (pink). A color scale bar at the top right ranges from 1 to 273.

INCREASING (horizontal arrow pointing right)

INCREASING (vertical arrow pointing down)

1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca											Kr	Rb	Sr											Xe	Cs	Ba											Rn	Fr	Ra											Uuo																		
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86	87	88											118																		
H	He																	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
1	2																	18	19	20											36	37	38											54	55	56											86</																															

Describe the Periodic Table

Like the Protons and Neutrons, the

Total # of

also increase on the PT as the as the Atomic # and Mass increase.

INCREASING

INCREASING

1 H	2 He																
3 Li	4 Be	5 B	6 C	7 N	8 O	9 F	10 Ne										
11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar										
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57-71	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89-103	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo

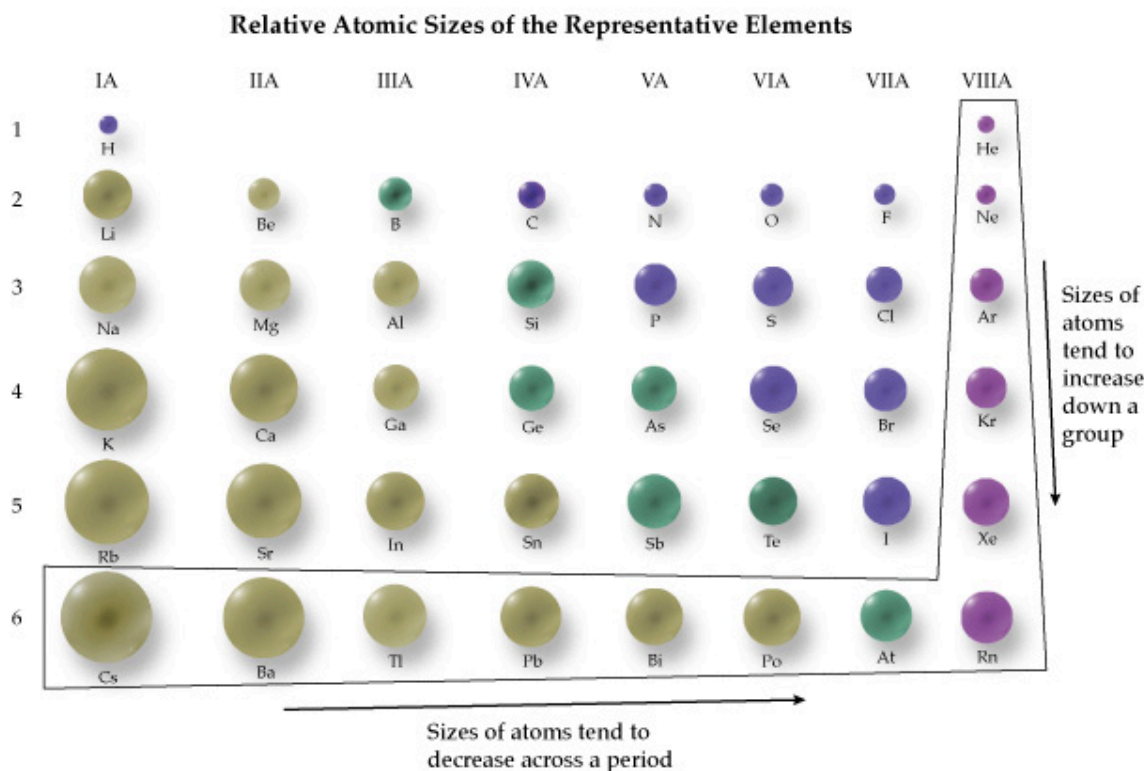
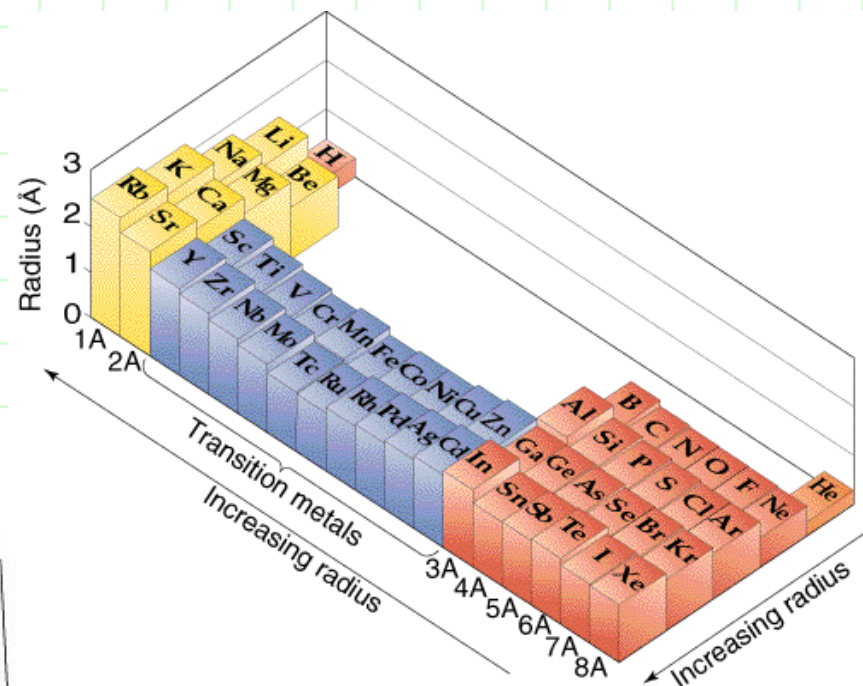
For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Trend in _____

WARNING:
NOT THE SAME AS ATOMIC #
AND MASS
WHY?

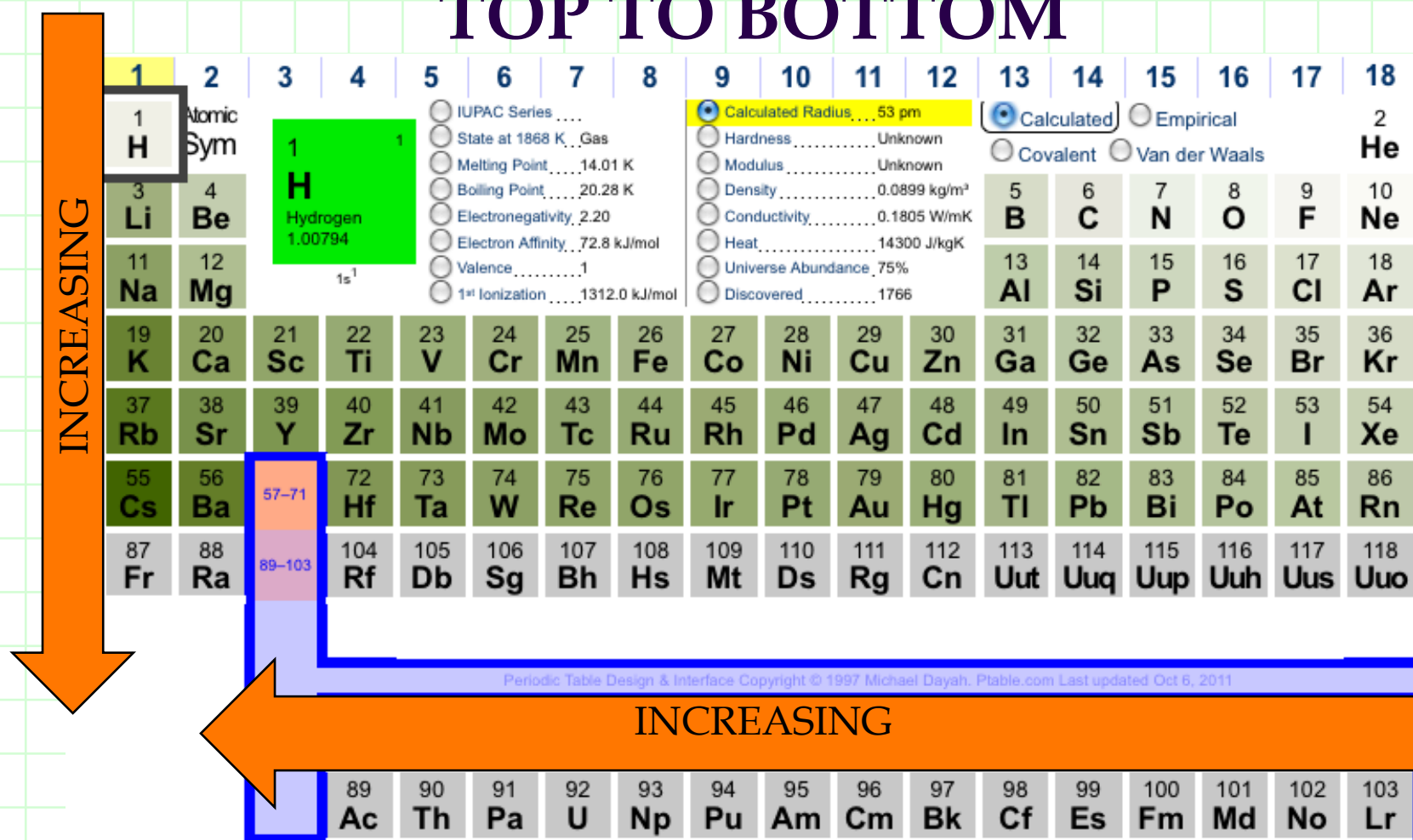


Trend in Atomic Radius

Increase as you move...

RIGHT TO LEFT

TOP TO BOTTOM



Periodic Table: Metallic arrangement

Layout of the Periodic Table: Metals vs. nonmetals

THE STAIRCASE

1 IA	2 IIA												13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1	2																	
3	4	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8	9 VIII	10	11 IB	12 IIB							
4	5																	
5	6																	
6	7																	
7	8																	

Layout of: Metals vs. Nonmetals vs. Metalloids

Quick Elements

1 H																	2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo
		58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu		
		90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr		

Tables

List

Periodic Table: The three broad Classes

Main (Representative), Transition metals, lanthanides and actinides (rare earth)

Quick Elements

1 H																	2 He
3 Li	4 Be	<div>Representative Elements</div> <div>Transition Elements</div> <div>Rare Earth Metals</div>										5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo

Rare earth elements

Lanthanides

Actinides

58 Ce 140.115	59 Pr 140.908	60 Nd 144.24	61 Pm 145	62 Sm 150.36	63 Eu 151.964	64 Gd 157.25	65 Tb 158.925	66 Dy 162.5	67 Ho 164.93	68 Er 167.26	69 Tm 168.934	70 Yb 173.04	71 Lu 174.967
90 Th 232.038	91 Pa 231.036	92 U 238.029	93 Np 237.048	94 Pu 244	95 Am 243	96 Cm 247	97 Bk 247	98 Cf 251	99 Es 252	100 Fm 257	101 Md 258	102 No 259	103 Lr 262

Tables

List

Describe the Periodic Table

Rows (and/or PERIODS) -

Elements of each row have the same number of _____ energy levels (shells).

Columns (and/or GROUPS /FAMILIES)-

Elements have the same number of electrons in the _____ energy level or shell (Pattern for Representative/Main Groups Only).

Elements in the same family have similar properties

Across the Periodic Table

Periods: Are arranged horizontally across the periodic table
(Rows 1-7)

These elements have the same number of Total Energy Levels or shells.

1 IA	2 IIA												13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1																		
2																		
3			3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8	9 VIII	10	11 IB	12 IIB						
4																		
5																		
6																		
7																		

Down the Periodic Table

Families: or groups, 1- 18 or 1-8 (MAIN)]

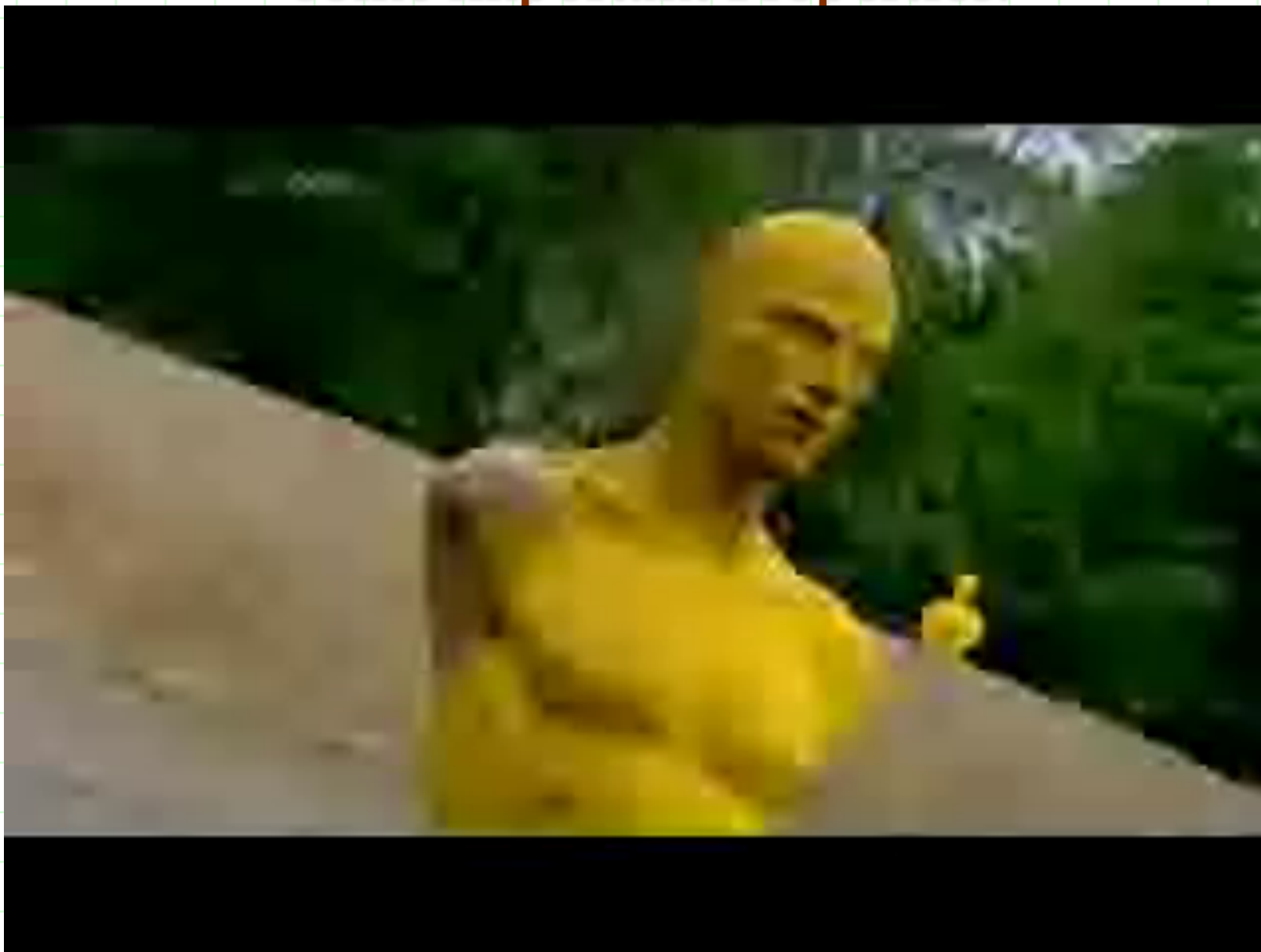
These elements have the same number of electrons in the outermost shells
(the Valence shell).

Alkali Family:
1 e- in the Valence Outermost shell

Halogen Family:
7 e- in the Valence Outermost shell

	1 IA	2 IIA											13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1																		
2																		
3			3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8	9 VIII	10	11 IB	12 IIB						
4																		
5																		
6																		
7																		

Notable families of the Periodic Table and some important Properties:



Infamous Families of the Periodic Table

	1	2	3	4	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	1 H	Atomic Sym															2 He	
2	3 Li	4 Be	5 B Liquid	6 C	7 N	8 O	9 F	10 Ne										
3	11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar										
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	57-71	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	89-103	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo

For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Infamous Families of the Periodic Table

	1	2	3	4	5																	4	15	16	17	18	
1	1 H	Atomic Syn	C Solid																						273	2 He	
2	3 Li	4 Be	Hg Unknown																								
3	11 Na	12 Mg	Rn Unknown																								
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr									
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe									
6	55 Cs	56 Ba	57-71	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn									
7	87 Fr	88 Ra	89-103	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo									

Metals

Alkali metalsAlkaline earth metalsLanthanoidsActinoidsTransition metalsPost-transition metals

For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

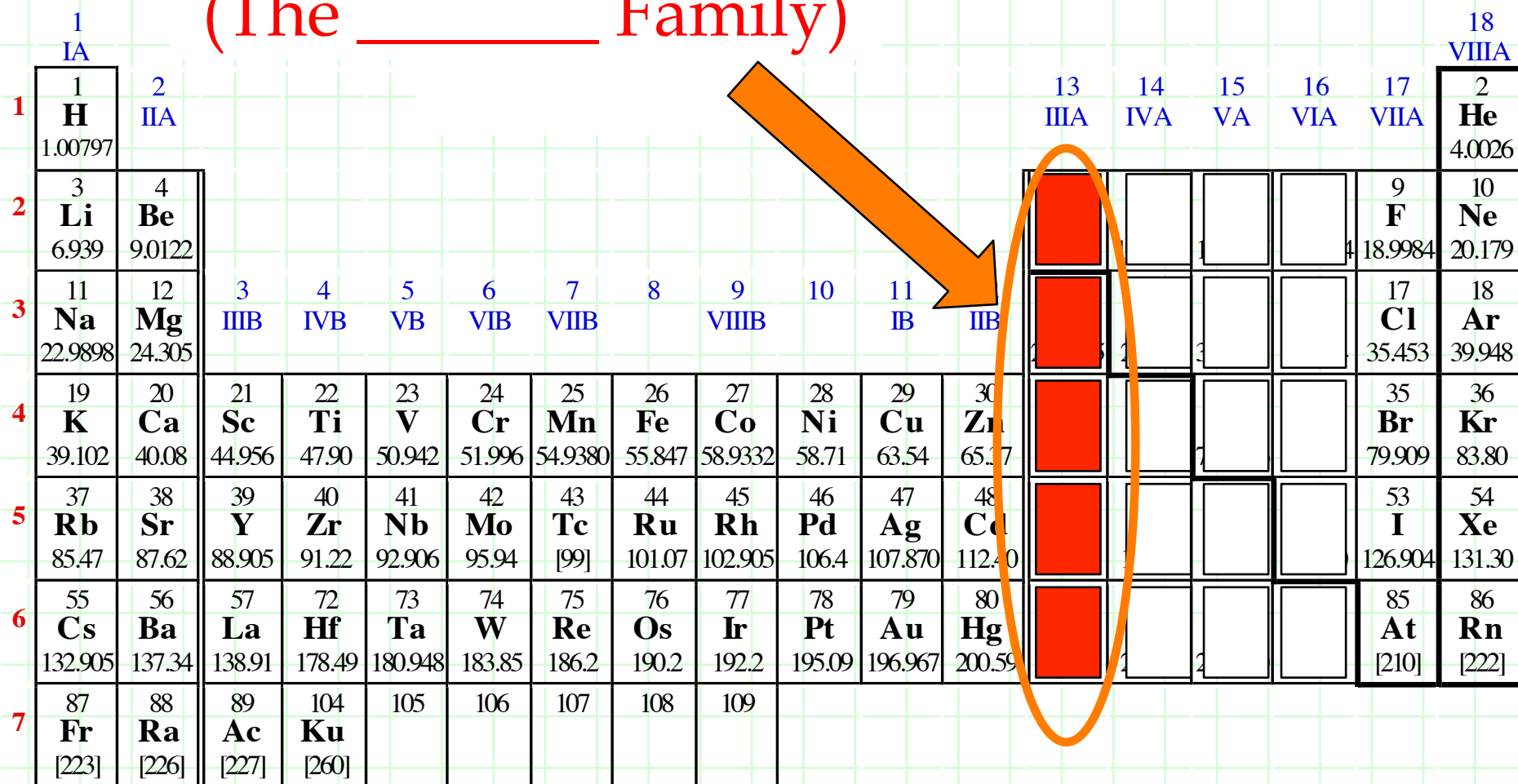
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57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Infamous Families of the Periodic Table

Family #3

(The _____ Family)



1 IA	2 IIA											13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1 H 1.00797	2 He 4.0026																
3 Li 6.939	4 Be 9.0122															9 F 18.9984	10 Ne 20.179
11 Na 22.9898	12 Mg 24.305	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8	9 VIII B	10	11 IB	12 IIB					17 Cl 35.453	18 Ar 39.948
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37					35 Br 79.909	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc [99]	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40					53 I 126.904	54 Xe 131.30
55 Cs 132.905	56 Ba 137.34	57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59					85 At [210]	86 Rn [222]
87 Fr [223]	88 Ra [226]	89 Ac [227]	104 Ku [260]	105	106	107	108	109									

Infamous Families of the Periodic Table

Family #4

(The _____ Family)

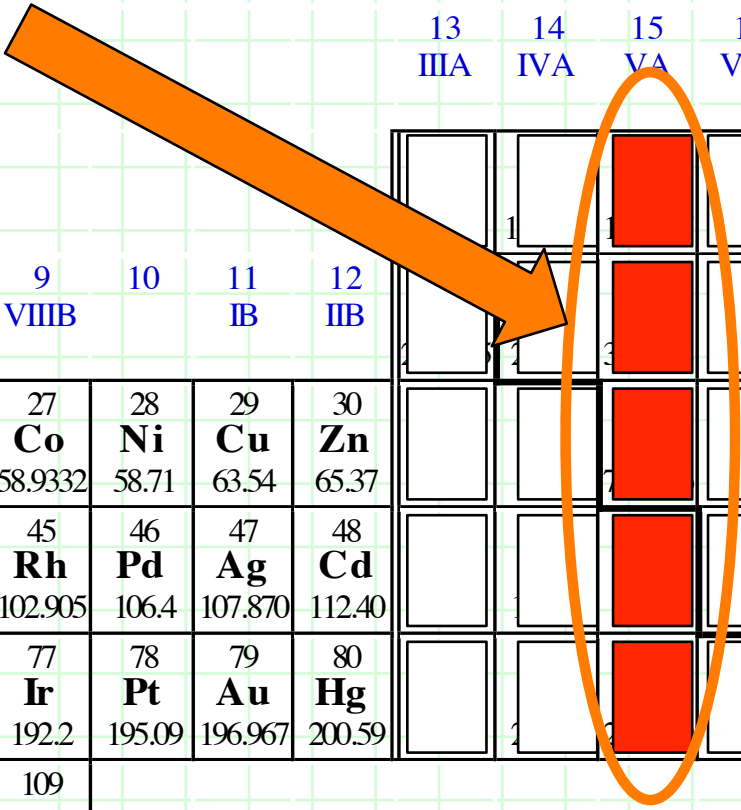
1 IA	2 IIA											13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1 H 1.00797																	2 He 4.0026
2 Li 6.939	4 Be 9.0122															9 F 18.9984	10 Ne 20.179
3 Na 22.9898	12 Mg 24.305	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8	9 VIII B	10	11 IB	12 IIB					17 Cl 35.453	18 Ar 39.948
4 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37					35 Br 79.909	36 Kr 83.80
5 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc [99]	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40					53 I 126.904	54 Xe 131.30
6 Cs 132.905	56 Ba 137.34	57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59					85 At [210]	86 Rn [222]
7 Fr [223]	88 Ra [226]	89 Ac [227]	104 Ku [260]	105	106	107	108	109									

Infamous Families of the Periodic Table

Family #5

(The _____ Family)

1 IA	2 IIA											13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1 H 1.00797																	2 He 4.0026
3 Li 6.939	4 Be 9.0122															9 F 18.9984	10 Ne 20.179
11 Na 22.9898	12 Mg 24.305	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8	9 VIII B	10	11 IB	12 IIB					17 Cl 35.453	18 Ar 39.948
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37					35 Br 79.909	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc [99]	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40					53 I 126.904	54 Xe 131.30
55 Cs 132.905	56 Ba 137.34	57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59					85 At [210]	86 Rn [222]
87 Fr [223]	88 Ra [226]	89 Ac [227]	104 Ku [260]	105	106	107	108	109									



Infamous Families of the Periodic Table

The FAMILY

	1 IA	2 IIA										13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1	1 H 1.00797																2 He 4.0026
2	3 Li 6.939	4 Be 9.0122														9 F 18.9984	10 Ne 20.179
3	11 Na 22.9898	12 Mg 24.305	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8	9 VIIIB	10	11 IB	12 IIB				17 Cl 35.453	18 Ar 39.948
4	19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37				35 Br 79.909	36 Kr 83.80
5	37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc [99]	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40				53 I 126.904	54 Xe 131.30
6	55 Cs 132.905	56 Ba 137.34	57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59				85 At [210]	86 Rn [222]
7	87 Fr [223]	88 Ra [226]	89 Ac [227]	104 Ku [260]	105	106	107	108	109								

Infamous Families of the Periodic Table

The _____

	1	2	3	4	5	6	7	8	9	10		13	14	15	16	17	18	
1	1 H	Atomic Sym	<div>C</div> Solid														2 He	
2	3 Li	4 Be	<div>Hg</div> Liquid														10 Ne	
3	11 Na	12 Mg	<div>H</div> Gas														18 Ar	
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	57-71	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	89-103	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo

For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Infamous Families of the Periodic Table

The _____

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 H	Atomic Sym	2 He Helium 4.002602															2 He
2	3 Li	4 Be																10 Ne
3	11 Na	12 Mg																18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	57-71 La Ce Pr Nd Pm Sm Eu Gd Tb Dy Ho Er Tm Yb Lu	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	89-103 Ac Th Pa U Np Pu Am Cm Bk Cf Es Fm Md No Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo

For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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Infamous Families of the Periodic Table

The

The Periodic Table

Nonmetals

Alkali metals Halogens Noble gases

Metals

Metalloids Transition metals Post-transition metals

273

2 He

5 B 6 C 7 N 8 O 9 F 10 Ne

13 Al 14 Si 15 P 16 S 17 Cl 18 Ar

27 Co 28 Ni 29 Cu 30 Zn 31 Ga 32 Ge 33 As 34 Se 35 Br 36 Kr

45 Rh 46 Pd 47 Ag 48 Cd 49 In 50 Sn 51 Sb 52 Te 53 I 54 Xe

55 Cs 56 Ba 57-71 72 Hf 73 Ta 74 W 75 Re 76 Os 77 Ir 78 Pt 79 Au 80 Hg 81 Tl 82 Pb 83 Bi 84 Po 85 At 86 Rn

87 Fr 88 Ra 89-103 104 Rf 105 Db 106 Sg 107 Bh 108 Hs 109 Mt 110 Ds 111 Rg 112 Cn 113 Uut 114 Uuq 115 Uup 116 Uuh 117 Uus 118 Uuo

For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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57 La 58 Ce 59 Pr 60 Nd 61 Pm 62 Sm 63 Eu 64 Gd 65 Tb 66 Dy 67 Ho 68 Er 69 Tm 70 Yb 71 Lu

89 Ac 90 Th 91 Pa 92 U 93 Np 94 Pu 95 Am 96 Cm 97 Bk 98 Cf 99 Es 100 Fm 101 Md 102 No 103 Lr

Infamous Families of the Periodic Table

The

Periodic Table of Elements

Atomic Sym Solid

Metalloids

Nonmetals

Other

Halogens

Noble gases

273

5 B 6 C 7 N 8 O 9 F 10 Ne

13 Al 14 Si 15 P 16 S 17 Cl 18 Ar

27 Co 28 Ni 29 Cu 30 Zn 31 Ga 32 Ge 33 As 34 Se 35 Br 36 Kr

45 Rh 46 Pd 47 Ag 48 Cd 49 In 50 Sn 51 Sb 52 Te 53 I 54 Xe

77 Ir 78 Pt 79 Au 80 Hg 81 Tl 82 Pb 83 Bi 84 Po 85 At 86 Rn

55 Cs 56 Ba 57-71 72 Hf 73 Ta 74 W 75 Re 76 Os

87 Fr 88 Ra 89-103 104 Rf 105 Db 106 Sg 107 Bh 108 Hs 109 Mt 110 Ds 111 Rg 112 Cn 113 Uut 114 Uuq 115 Uup 116 Uuh 117 Uus 118 Uuo

For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Infamous Groups / Families of the Periodic Table

Quick Elements

1 H																	2 He
3 Li	4 Be	Alkali Metals		Alkaline Earth Metals		5 B	6 C	7 N	8 O	9 F	10 Ne						
11 Na	12 Mg	Transition Metals		Lanthanides		13 Al	14 Si	15 P	16 S	17 Cl	18 Ar						
		Actinides		Halogens													
		Noble Gases															
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo
		58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu		
		90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr		

Tables

List

How do the Elements Exist

At Room Temperature (25°C)

90% are SOLIDS

290 Kelvin
17 °Celsius
62 °Fahrenheit

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 H 1																	2 He 2
3 Li 3	4 Be 4											5 B 5	6 C 6	7 N 7	8 O 8	9 F 9	10 Ne 10
11 Na 11	12 Mg 12											13 Al 13	14 Si 14	15 P 15	16 S 16	17 Cl 17	18 Ar 18
19 K 19	20 Ca 20	21 Sc 21	22 Ti 22	23 V 23	24 Cr 24	25 Mn 25	26 Fe 26	27 Co 27	28 Ni 28	29 Cu 29	30 Zn 30	31 Ga 31	32 Ge 32	33 As 33	34 Se 34	35 Br 35	36 Kr 36
37 Rb 37	38 Sr 38	39 Y 39	40 Zr 40	41 Nb 41	42 Mo 42	43 Tc 43	44 Ru 44	45 Rh 45	46 Pd 46	47 Ag 47	48 Cd 48	49 In 49	50 Sn 50	51 Sb 51	52 Te 52	53 I 53	54 Xe 54
55 Cs 55	56 Ba 56	57-71 Lanthanides	72 Hf 72	73 Ta 73	74 W 74	75 Re 75	76 Os 76	77 Ir 77	78 Pt 78	79 Au 79	80 Hg 80	81 Tl 81	82 Pb 82	83 Bi 83	84 Po 84	85 At 85	86 Rn 86
87 Fr 87	88 Ra 88	89-103 Actinides	104 Rf 104	105 Db 105	106 Sg 106	107 Bh 107	108 Hs 108	109 Mt 109	110 Ds 110	111 Rg 111	112 Cn 112	113 Nh 113	114 Fl 114	115 Mc 115	116 Lv 116	117 Ts 117	118 Og 118
For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.																	
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57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu			
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr			

How do the Elements Exist At Room Temperature (25°C)

Red = GASES

290 Kelvin

17 °Celsius

62 °Fahrenheit

	1	2											11	12	13	14	15	16	17	18
1	1 H												5 B	6 C	7 N	8 O	9 F	10 Ne		
2	3 Li	4 Be											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar		
3	11 Na	12 Mg											31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr		
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe		
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn		
6	55 Cs	56 Ba	57-71	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn		
7	87 Fr	88 Ra	89-103	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo		

For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

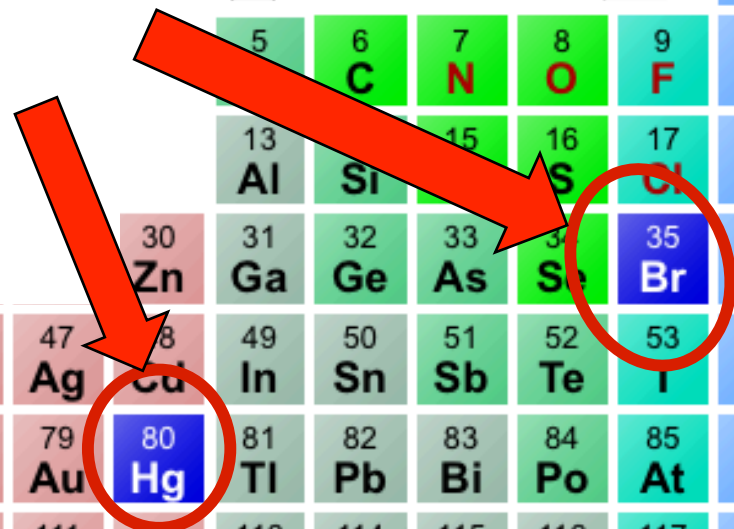
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57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

How do the Elements Exist At Room Temperature (25°C)

	1	2	3	4	5		12	13	14	15	16	17	18
1	1 H	Atomic Sym		C Solid									2 He
2	3 Li	4 Be	Hg Liquid										10 Ne
3	11 Na	12 Mg	H Gas										18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V								36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cu	54 Xe
6	55 Cs	56 Ba	57-71	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	86 Rn
7	87 Fr	88 Ra	89-103	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	118 Uuo

There are only
2 Elements
That =
Liquids



For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Summary

Periodic Table: Map of the Building block of matter

Type: Metal, Metalloid and Nonmetal

Family/Group: Elements in the same column have similar chemical property because of similar valence electrons

Alkali, Alkaline, Family #3 (Boron), #4 (Carbon), #5 (Nitrogen), #6 Oxygen family, Halogens, Noble gases, Transition metals, Representative (main), Rare Earth Metals (Lanthanides, Actinides)

Period: Elements in the same row have the same number of energy levels and/or electron shells.

Use this link below for an interactive and informative periodic table.

<http://www.ptable.com/>

Or...

App Store > Reference > Quick Learning LLC



Quick Periodic Table of the Elements

Description

Quick Elements offers rapid access to information on the elements useful periodic tables summarize a variety of information. Separate screens for . Access to that data is provided by a searchable list of elements that the u

Quick Periodic Table of the Elements Support >

Free App

